

Remarks/Arguments

This amendment is made for the purpose of complying with a matter of form, in particular the Examiner's statement "Additionally, the claims do not define the axial length of the first and second portions" on pages 3, 5, and 6 of the Office Action, and entry of this amendment under the provisions of 37 CFR 1.116 is respectfully requested.

Reconsideration of the rejection of claims 1-7, 9-12 and 14-16 under 35 USC 112, first paragraph, is respectfully requested for the following reasons. The application, as originally filed, does disclose "the axial length of the first portion being at least three times the axial length of the second portion and the inlet having a diameter at least four times the diameter of the outlet" recited in claim 1 and similarly in claim 9. The first paragraph on page 8 of the application discloses the axial distance from end face 32 to intermediate location 24 (the axial length of the first portion) being 0.292 inch and the axial length of passage portion (the second portion) being 0.085. Thus, there is an original disclosure of the axial length of the first portion being at least three times the axial length of the second portion. In addition, Fig. 3 and Fig. 4 of the application drawing as originally filed provide a similar disclosure.

Furthermore, the first paragraph on page 8 of the application discloses the diameter of inlet 14 being 0.110 inch and the diameter of outlet 16 being 0.008 inch. Thus, there is an original disclosure of the inlet having a diameter at least four times the diameter of the outlet. In addition, Fig. 3 and

Fig. 4 of the application drawing as originally filed provide a similar disclosure.

Accordingly, claims 1-7, 9-12, and 14-16 are believed to satisfy the written description requirement of 35 USC 112, first paragraph.

Reconsideration of the rejection of claims 1-5, 9-12 and 16 under 35 USC 103 based on Richter is respectfully requested for the following reasons. Richter discloses a nozzle for modulating flow of molten metal from a tundish in a continuous casting system. Applicant's invention, on the other hand, is a precision dispensing tip for dispensing small amounts of fluid, for example viscous materials such as adhesive on printed circuit boards, where it is important to provide consistent shapes of the material applied to a series of locations on a surface and to do so at a relatively fast rate of travel from location to location. Richter does not disclose a precision dispensing tip in the manner provided by applicant's claimed invention.

Richter is concerned with the considerably different problem of destructive cracking in a nozzle which handles a relatively large volume flow of molten metal, such cracking being caused by large thermal gradients giving rise to different rates of thermal expansion in the shells or layers of a nozzle composite body. Applicant's invention, on the other hand, is directed to the problem of avoiding discontinuities in the fluid flow and avoiding introduction of turbulence to the fluid flow in a tip for dispensing small amounts of fluid in consistent sizes and shapes to a series of locations along a surface.

An aspect of applicant's invention contributing to the solution of the foregoing problem is the fact that the axial length of the first or converging portion of the fluid conducting passage is several times greater than the second portion which extends from the converging portion to the outlet. In the nozzle of Richter, on the other hand, the axial length of the converging section B is substantially equal to the axial length of the section between B and outlet 37. The foregoing significant distinction over Richter is brought out in claim 1 which calls for the axial length of the first portion being at least three times the axial length of the second portion. Likewise, claim 9 calls for the length of the first or converging portion being at least three times the length of the second portion which extends from the first portion to the outlet.

In addition, it is submitted that one skilled in the art, seeking to solve the problem to which applicant's invention is directed, would not look to the significantly different art represented by Richter which deals with avoiding destructive cracking in a nozzle handling relatively large volumes of flow of molten metal.

On page 3 of the Office Action the Examiner refers to Richter's constant diameter nozzle interior 35 as "a fluid conducting passage." Accordingly, it would have to include an inlet at its upstream end (top of Fig. 3) in view of the direction of flow indicated by the arrow in Fig. 3. However, the Examiner refers to the inlet to Section B of Richter, which is downstream from interior 35, as "an inlet." Independent claims 1 and 9, on the other hand, call for the first portion of

the fluid conducting passage converging in a direction immediately from the inlet. Thus, there is no structural analogy or correspondence between Richter and applicant's claimed dispensing tip because the constant diameter "fluid conducting passage" 35 of Richter does not have a first portion converging immediately from its inlet.

Claims 1 and 9 have been amended to overcome the Examiner's objection that they did not define the axial lengths of the first and second portions.

The application of the cited decision In re Aller is believed to be improper. In particular, the cited holding of In re Aller that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves routine skill in that the art was based on the subject matter of the claim on appeal (process for producing phenol) and the subject matter of the prior art (process for producing phenol) being in the same field of art. In fact, the Court in Aller stated:

The process of appellants is identical with that of the prior art, except that appellants' claims specify lower temperatures and higher sulphuric acid concentrations than are shown in the reference.

Here, the subject matter of the claims on appeal (avoiding discontinuities in the fluid flow and avoiding introduction of turbulence to the fluid flow in a tip for dispensing small amounts of fluid in consistent sizes and shapes to a series of locations along a surface) and the subject matter of Richter (avoiding destructive cracking in a nozzle handling relatively large volumes of flow of molten metal) are not in the same field

of art but, to the contrary, are in non-analogous fields of art very remote from each other. Thus, it is respectfully submitted that In re Aller is inapplicable to this situation and that the claimed subject matter referenced in the first two paragraphs on page 4 of the Office Action are entitled to be given weight on the issue of patentability.

In view of the foregoing, claims 1-5, 9-12 and 16 as amended are believed to patentably distinguish over Richter within the meaning of 35 USC 103.

Reconsideration of the rejection of claim 1 under 35 USC 103 based on Tomasello is respectfully requested for the following reasons. Tomasello is directed to a nozzle for use in fluid stripping apparatus, such as that found in automatic vehicle car washes for stripping rinse water from the vehicle surface, employing air at high velocity and high pressure. Thus, Tomasello does not disclose a precision dispensing tip as claimed by applicant.

Tomasello is directed to the considerably different problem of providing "a fluid stripping apparatus which projects air from a nozzle much further than conventional apparatus without appreciable loss of velocity to deliver a high-volume, high-pressure flow of air at low horsepower and which can strip fluids from a surface at a distance."

Claim 1 calls for the first or converging portion of the fluid conducting passage being in the shape substantially of a frustum of a right circular cone. The portion 16a, 16b of the Tomasello nozzle does not have this shape. Claim 1 further calls for the inlet having a diameter at least four times the

diameter of the outlet. In the Tomasello nozzle, the diameter of inlet 14 is about three times the diameter of outlet 20 (col. 4, lines 6 and 7). These aspects of applicant's invention called for in claim 1 contribute to the solution of the problem of avoiding discontinuities in the fluid flow and avoiding introduction of turbulence to the fluid flow in a tip for dispensing small amounts of fluid in consistent sizes and shapes to a series of locations along a surface.

In addition to the foregoing, it is submitted that one skilled in the art, seeking to solve the problem to which applicant's invention is directed, would not look to the significantly different art represented by Tomasello which deals with a nozzle for handling a large volume of air.

Claim 1 has been amended to overcome the Examiner's objection that it does not define the lengths of the first and second portions. Furthermore, the application of In re Aller is believed to be improper for the same reasons given above with respect to the Richter reference, and it is respectfully submitted that the claimed subject matter referenced in the second full paragraph on page 5 of the Office Action should be given weight on the issue of patentability.

In view of the foregoing, amended claim 1 is believed to patentably distinguish over Tomasello within the meaning of 35 USC 103.

Reconsideration of the rejection of claims 1, 6 and 7 under 35 USC 103 based on Heron et al. in view of Vickers is respectfully requested for the following reasons. In the nozzle assembly of Heron, the axial length of the converging portion 5 is many times shorter than the axial length of the portion 3

which extends from portion 5 to outlet 6. This is the exact opposite of the structure feature of applicant's precision dispensing tip called for in claim 1.

Vickers, which discloses a cavitation nozzle for a high velocity jet of fluid having both diverging 22 and converging 24 sections separated by a constant diameter section 26, is not believed to disclose anything having a bearing on the reasons why claim 1 is believed to patentably distinguish over Heron.

Claim 1 has been amended to overcome the Examiner's objection that it does not define the lengths of the first and second portions. Furthermore, the application of In re. Aller is believed to be improper for the same reasons given above with respect to the Richter reference, and it is respectfully submitted that the claimed subject matter referenced in the third full paragraph on page 6 of the Office Action should be given weight on the issue of patentability.

Accordingly, claim 1 as amended and dependent claims 6 and 7 are believed to patentably distinguish over Heron et al. and Vickers within the meaning of 35 USC 103.

The rejection of claims 14 and 15 under 35 USC 103 based on Richter in view of Vickers is respectfully traversed. Dependent claims 14 and 15 include all the limitations of amended claim 9 which, for the reasons set forth above, is believed to patentably distinguish over Richter within the meaning of 35 USC 103. Vickers is not considered to disclose anything having a bearing on the reasons why amended claim 9 is believed to patentably distinguish over Richter. Accordingly, claims 14 and 15 are believed to patentably distinguish over Richter and Vickers within the meaning of 35 USC 103.

As mentioned hereinabove, this amendment is made for the purpose of complying with a matter form in response to the Examiner's comment on the axial lengths of the first and second portions. In addition, the subject matter of the axial lengths of the first and second portions was discussed in applicant's Amendment, Paper No. 19, filed November 28, 2003. Accordingly, this amendment is not believed to raise any new issues, and entry of this amendment under the provisions of 37 CFR 1.116 is respectfully requested.

Favorable action on this application is respectfully requested.

Respectfully submitted,
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